

**Inuvialuit Settlement Region Community-Based Monitoring Program (ISR-CBMP):  
Community-Driven Monitoring of Locally Important Natural Resources**

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### **Executive Summary**

The Western Canadian Arctic is facing a growing list of environmental stressors such as climate change, increased industrial development, hydrocarbon activity, environmental contaminants, and invasive species. Since the signing of the Inuvialuit Final Agreement (IFA) in 1984, there have been a number of cooperative initiatives that demonstrate the region's commitment to collecting community-based monitoring data. Collectively, these experiences pointed to the need for a networked approach to community-based monitoring. The Inuvialuit Game Council, supported by the three resource committees created pursuant to the IFA are establishing a community-based monitoring network that focuses on Inuvialuit community needs and interests, while still allowing for the interaction of various government agencies and other interests active inside the scientific community both within, and beyond the Inuvialuit Settlement Region (ISR). Moving towards a collaborative, community-based monitoring network model is a way of stimulating action towards understanding and addressing environmental, scientific, and community questions and concerns. The design of the ISR-wide community-based monitoring program (CBMP) considers the wide array of environmental variables and human activities within the ISR. The CBMP will have at its core a set of community-driven variables to be tracked over time, across the region, allowing community members and scientists to identify long-term spatial and temporal trends. The data will also be related to monitoring efforts conducted on a broader scale, so that local changes and trends can be placed into a wider context of environmental and ecological observations. Local interests will shape the parameters of the monitoring effort, so that Inuvialuit communities maintain ownership and derive direct benefit. In this White Paper we examine the value of a networked approach to community-based monitoring for helping individual Inuvialuit communities ascertain the information, tools, and educational training they need to understand how emerging environmental stressors are affecting their subsistence and cultural activities.

## Introduction

*“We are really noticing a lot of change: Birds, animals, seals are disappearing. We need a monitor to observe this year round.”*

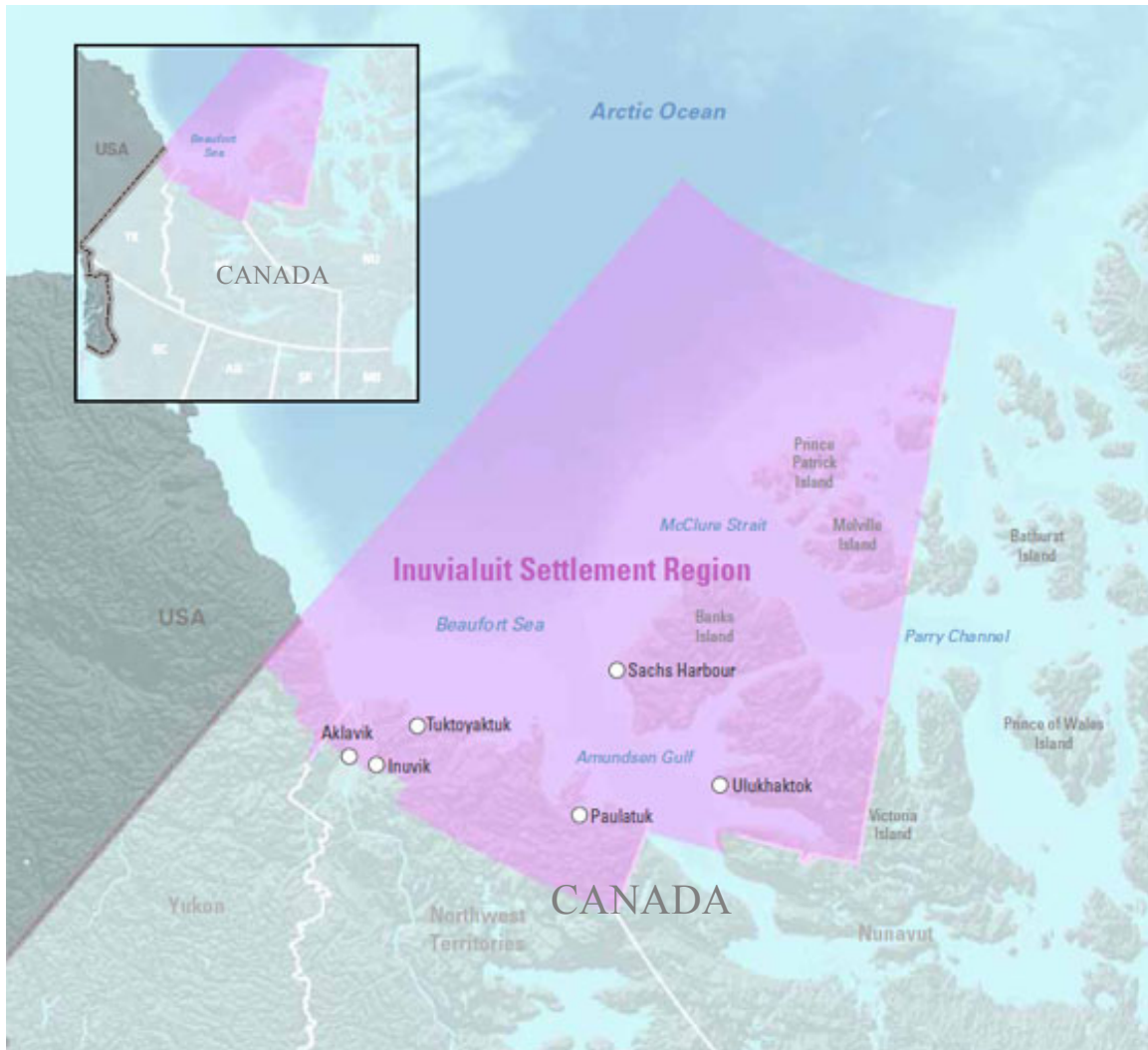
– Tony Green, Paulatuk

The Inuvialuit Settlement Region (ISR) in Canada’s Western Arctic (Figure 1) is facing a growing list of environmental stressors such as climate change, increased industrial development, hydrocarbon activity, environmental contaminants, and invasive species. In support of the mandate and provisions of the Inuvialuit Final Agreement (14.1-14.5)<sup>1</sup>, the Inuvialuit Settlement Region – Community-Based Monitoring Program (ISR-CBMP) will contribute rigorous data sets and local expert knowledge to communities, managers and other decision makers in the ISR in order to “protect and preserve the Arctic wildlife, environment and biological productivity through the application of conservation principles and practices; achieve effective protection of the ecosystems in the Inuvialuit Settlement Region, through an integrated wildlife and land management regime, to be attained through various means, including the coordination of legislative authorities; and, employ the relevant knowledge and experience of both the Inuvialuit and the scientific communities in order to achieve conservation”<sup>1</sup>.

The design of the ISR-wide community-based monitoring program (CBMP) will have to consider the wide array of environmental variables and human activities within the ISR. The selection of appropriate indicators for monitoring will be critical to the success of the program. The CBMP will have at its core a set of community-driven variables to be tracked over time, across several areas, allowing community members and scientists to identify long-term spatial and temporal trends. The data will also be related to monitoring efforts conducted on a broader scale, so that local changes and trends can be placed into a wider context of environmental and ecological observations. Local interests will shape the parameters of the monitoring effort, so that Inuvialuit communities maintain ownership and derive direct benefit.

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<sup>1</sup> THE WESTERN ARCTIC CLAIM – The Inuvialuit Final Agreement (As Ammended)  
[http://www.inuvialuitland.com/resources/Inuvialuit\\_Final\\_Agreement.pdf](http://www.inuvialuitland.com/resources/Inuvialuit_Final_Agreement.pdf)



**Figure 1.** The Inuvialuit Settlement Region (ISR) in Canada's western Arctic is highlighted in purple. The six ISR communities are marked on the map (Aklavik, Inuvik, Paulatuk, Sachs Harbour, Ulukhaktok, Tuktoyaktuk). Map from: National Energy Board <http://www.neb-one.gc.ca>

The 21st century has seen renewed interest in developing Canadian Arctic oil and gas reserves.<sup>2</sup> Historically, hydrocarbon development efforts focused on land or shallow water hydrocarbon potential. Since 2008, the industry has shifted its attention to the deepwater areas of the Canadian Beaufort Sea – a region that to date has experienced limited exploration and no development.<sup>3</sup> In the wake of the huge 2009 Macondo oil spill in the Gulf of Mexico, Canada's National Energy Board (NEB) initiated a public review of offshore drilling in the Canadian Arctic to ensure the regulatory system was prepared to handle the unique challenges of Arctic drilling.<sup>4</sup>

<sup>2</sup> Northern Canada is estimated to contain one third of Canada's remaining potential for conventional oil and natural gas (<http://www.aadnc-aandc.gc.ca/eng/1100100037301>)

<sup>3</sup> Aboriginal Affairs and Northern Development Canada. "Northern Oil And Gas Annual Report." 2011. p(9). [http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ/STAGING/texte-text/nog\\_ann2011\\_pdf\\_1335968796614\\_eng.pdf](http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ/STAGING/texte-text/nog_ann2011_pdf_1335968796614_eng.pdf)

<sup>4</sup> The National Energy Board. "The past is always present: Review Of Offshore Drilling in the Canadian Arctic." December 2011. p(3). <http://www.neb-one.gc.ca/clfnsi/rthnb/pplctnsbfrthnb/rctcfffshrdrlngvrw/rctcfffshrdrlngvrw-eng.html>

The NEB *Arctic Drilling Review* served as a platform for organizations established pursuant to the Inuvialuit Final Agreement and the communities of the Inuvialuit Settlement Region to voice their interests and concerns regarding oil and gas development. These groups shared a number of common positions: (1) oil and gas activities could impact the environment, and the plants, fish, birds, and mammals that Inuvialuit use for subsistence purposes; (2) hunting and fishing are vital parts of Inuvialuit culture and community; (3) the Arctic is one of the least understood places on earth and the climate is rapidly changing; and (4) industry must employ world class environmental standards and risk management practices.

Cumulative impacts are a growing concern in the Inuvialuit Settlement Region due to a rapidly changing climate and environment and as a result the increased industrial interest in the area. Concerns about the cumulative impacts of oil and gas exploration with potential oil spills, increased marine shipping, long-range transport of airborne pollution, highly variable weather including more severe storms, warmer weather, melting permafrost, less sea ice, increasing numbers of invasive species and how these cumulative impacts will affect the natural resources on which the Inuvialuit rely warrants the need for rigorous, repeatable and useful long-term monitoring of locally-important species and environmental conditions.

Since the signing of the Inuvialuit Final Agreement (IFA) in 1984<sup>1</sup>, there have been a number of cooperative initiatives that demonstrate the region's commitment to collecting community-based monitoring data. A few examples of these are the Inuvialuit Harvest Study<sup>5</sup>, the Fish and Marine Mammal Monitoring Program (formally the Beluga Monitoring Program)<sup>6</sup>, and the Tarium Niryutait Marine Protected Area<sup>7</sup>. Collectively, these experiences pointed to the need for a networked approach to community-based monitoring. The Inuvialuit Game Council (IGC), supported by the three renewable resource committees created pursuant to the IFA are examining mechanisms to establish a community monitoring network that will focus on Inuvialuit community needs and interests, while still allowing for the interaction of various government agencies and other interests active inside the scientific community both within, and beyond the Inuvialuit Settlement Region. Moving towards a collaborative, community-based monitoring network model is a way of stimulating action towards understanding and addressing environmental, scientific, and community questions and concerns.

In the fall of 2010 at an environmental monitoring workshop in Whitehorse Yukon, widespread interest was expressed by members of the IFA-based co-management bodies and Inuvialuit Game Council in establishing an ISR-wide community based monitoring program (CBMP). Further to that workshop, a CBMP community tour in February 2011 and the six-community CBMP workshop in Inuvik with representatives of co-management committees in April 2011 confirmed the ISR communities' desire to create and implement the ISR-CBMP.

The Inuvialuit-Canada Fisheries Joint Management Committee (FJMC) co-management board through its involvement in community-based for many years has recognized the

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<sup>5</sup> Inuvialuit Harvest Study – Data and Methods Report 1988-1997

<http://www.jointsecretariat.ca/pdf/js/IHS10yrDataMethodsReport.pdf>

<sup>6</sup> Fisheries Joint Management Committee – Annual Report 2005-2006. p(6).

[http://fishfp.sasktelwebhosting.com/publications/FJMC%20Annual%20Report%2005\\_06.pdf](http://fishfp.sasktelwebhosting.com/publications/FJMC%20Annual%20Report%2005_06.pdf)

<sup>7</sup> Tarium Niryutait Marine Protected Area [http://www.beaufortseapartnership.ca/tntp\\_area.html](http://www.beaufortseapartnership.ca/tntp_area.html)

value of increased community capacity to better position community, science and resource board needs in the conduct of their programs. To that end when the opportunity to invest in a program that might address this in the future the Committee endorsed the program and provided leadership and funding for the initial community meetings and design of the program. In the last year the Committee has been pleased to provide the necessary funds to initiate the program, work with the Steering Committee, and provide the opportunity for long-term success. Oceans North Canada has also been a key player in the initiation of this program providing support, expert input and two years of funding for the pilot program.

In this White Paper we examine the value of a networked approach to community monitoring for helping individual Inuvialuit communities ascertain the information, tools, and educational training they need to understand how emerging environmental stressors are affecting their subsistence and cultural activities. We also outline how this network of local observation systems will provide a pragmatic platform to imbue local expert and traditional knowledge into the design and execution of regional science programs. We also examine the specific hindrances to the collection and sharing of Arctic observations in the ISR. Finally, we consider how a successful community-based monitoring program in the ISR could connect to and inform a pan-Arctic monitoring effort.

### **The ISR-CBMP Pilot (Year 1, commencing January 2013)**

#### ***Community Input: First CBMP ISR-Wide Community Tour***

Before the ISR-CBMP officially started in January 2013, the initial step in planning the CBMP process was a community tour held in February 2011 to assess community interest in developing a coordinated approach to community based monitoring in the ISR. The community tour also provided a baseline of monitoring concerns for each community within the ISR. The primary objective of the community tour was to confirm community interest in developing a community-based monitoring program for the ISR. Additional objectives were: (1) to gather information from the Hunters and Trappers Committees (HTCs) of the ISR, which described elements they wanted included in a new, community-based monitoring program for the ISR, (2) and to prepare the communities to participate in the Inuvik workshop.

The community tour affirmed community interest in a new approach to community-based monitoring in the ISR. The tour also provided information that helped ensure the April 2011 workshop was accurately focused on current areas of community concern and interest. During the community tour key motifs were identified that helped shape the objectives for the April 2011 workshop.

#### ***Community Input: ISR-Wide CBMP Workshop***

The second step in the CBMP planning process was a joint workshop between the communities of the ISR and science experts. The workshop was held in Inuvik the week of April 11-15, 2011. The workshop had three areas of focus: (1) to review and share the information from the community tour; (2) to forward a series of objectives that would begin to shape the components of an ISR-wide community monitoring network; (3) to make a series of recommendations to the IGC which outlined options for operationalizing a community monitoring program for the ISR.

There were several overarching themes that emerged throughout the April 2011 ISR community-based monitoring workshops. One of the major themes that emerged from the workshops was not reinventing the wheel and building on what already exists. This means building on existing monitoring plans and methods, building on existing knowledge databases for the region and learning from other successful Canadian (and circumpolar) community-based monitoring models. Another key concept of building on what already exists is the incorporation of Traditional Knowledge and Local Expert Knowledge into all community monitoring plans. A huge wealth of knowledge exists in the communities through elders, hunters, fishers, monitors, rangers, youth and local observers. This knowledge should not only be recorded but used in equal value to that of scientific knowledge. The third concept arising from the theme of building on what already exists was the idea of “research is not monitoring”. There is monitoring that suits the need of the community and monitoring that suits the needs of the scientist. Needs of the community should be the priority for monitoring efforts. Participants suggested that monitoring should lend to the identifying areas where research is needed and dictated by the community. This way there would be researchers coming to the communities who would be studying community-identified areas of concerns and could also be contributing data and knowledge to the ISR-wide CBMP.

### ***Community Input: Second ISR-Wide CBMP Community Tour to Update Monitoring and Infrastructure Needs***

A second community tour is currently underway to update monitoring needs, ensure that all community needs are captured, and to find out capacity building, program infrastructure and implementation needs. The next two years of the ISR-CBMP will focus on designing and implementing the ISR-CBMP including training and hiring of the local CBMP liaison from the six ISR communities. The program design will focus on community input and the results of the

With improved community capacity and local delivery more attention can be focused on those issues that communities deem most critical to their needs. These elements will be the identification, collection, storage and use of TEK/LEK, determining how these data sets are used and applied to local and regional management decisions, and ensuring that collected data is maintained in a standardized and useable format accessible to all communities in a timely manner. As the program is being designed to meet community and decision-makers needs for CBM in the ISR, all affected parties will be consulted on an on-going basis to determine needs, standardized methodologies for data collection and program design.

### **The ISR-CBMP Design and Implementation**

The ISR-CBMP is supported by all six ISR communities as well as the ISR renewable resource co-management boards. These include the Inuvialuit Game Council (IGC) representing all ISR Hunters and Trappers Committees (HTCs) and the co-management boards (Fisheries Joint Management Committee (FJMC), Wildlife Management Advisory Council NWT (WMAC-NWT), Wildlife Management Advisory Council Yukon North Slope (WMAC-NS). It is the decision makers themselves who initiated the creation of the ISR-CBMP. Its purpose is to have a community-driven region-wide CBM program that acts as an umbrella program encompassing and synthesizing all CBM in the ISR including local, government, industry and researcher

projects in relation to the environment and wildlife, while supporting community needs and interests in the design and implementation of the program. There are at minimum three identifiable user groups for a community-based monitoring effort. Communities' concerns and priorities will drive the program, followed by the management needs and priorities of the co-management committees. On this basis, the following priority is assigned to future data users:

**Level 1:** ISR communities

**Level 2:** ISR co-management committees

**Level 3:** Third parties (government, academia, industry, non-government organizations)

The initial program design will be based on the recommendations of the community workshops, local expert input and the guiding principles established by the Steering Committee. These principles recognize the past successful efforts by government agencies and the communities to invest in participatory community monitoring efforts. While a key principle will be to emulate the successful features of those programs this is to be a new program that will improve community capacity while increasing the efficiency and effectiveness of data collections in support of community and agency needs. It is also intended to increase the attention being focused on current and changing environmental conditions, related impacts throughout the ISR, improving the state of knowledge with an emphasis on the equal inclusion of Traditional Ecological Knowledge (TEK) and Local Expert Knowledge (LEK), and acquiring continuing long term data sets where possible.

Key components of the program are as follows:

1. Equal inclusion of TEK/LEK in the CBMP. The design of the CBMP should help to fully integrate TEK into scientific research.
2. Youth/elder involvement is key to building and fostering long-term community interest and involvement. Involve Aurora College and University of the Arctic as well as high school students in the CBMP and provide extensive training to local CBMP liaisons.
3. A full time or near full time CBMP liaison will be hired in each ISR community to conduct and direct natural resource-based monitoring activities or other monitoring activities of interest to the community or to external agencies. Full training for each CBMP liaison including training for safety, monitoring protocols, field work, computer use, data analyses and report writing.
4. A regional coordination position assisting in the development and management of the program at the Inuvialuit Joint Secretariat (J. Knopp).
5. Continuing support and leadership from the Inuvialuit Game Council, Hunters and Trappers committees of the six ISR communities, co-management committees, and local government and agency managers.
6. Information management and ownership, storage, access and control protocols created and implemented for both quantitative plus TEK/LEK data. Information should be managed by the Inuvialuit Joint Secretariat with input from the HTC's to ensure information is treated sensitively and there will be an improved and timely flow of information back to communities as well as between the communities.
7. Address a wide range of topics from wildlife and fish population numbers to contaminant levels in country foods to environmental effects on wildlife to water quality monitoring to baseline data collection.

8. Build on partnerships and monitoring structures already in place.
9. Increased communication between communities would be beneficial in keeping goals in sight.
10. A monitoring and evaluation mechanism to determine best practices and improve program delivery and ensure validity and accuracy of data outputs.
11. Annual funding requirements identified and confirmed as continuing to promote continuity and consistency in community positions and monitoring databases.

A secondary but critical consideration will be to position community inputs and data that while confined to the ISR, may have much broader applications in the NWT and the Arctic such as the Cumulative Impacts Monitoring Program, initiatives around pan-Arctic Oceans monitoring, and tracking and monitoring effects of global warming. Positioning the CBM around some of these larger scale issues should assist in the challenges associated with managing beyond localized issues and examining trends and activities from an ecosystem perspective. Again the initial task will be to build a simple effective monitoring system for the ISR, and if should larger and long term benefits accrue around the secondary considerations; this would indeed be a beneficial outcome.

### **Improving the Design, Implementation, Coordination and Sustained Long-Term Operation of this Arctic Observing System**

The ISR-CBMP is shifting the paradigm of observing systems in the ISR towards the monitoring needs of the resource users themselves while still addressing decision-makers needs. Specific ways in which the ISR-CBMP is improving design, implementation, coordination and sustained long-term observation are outlined below:

1. **Addressing community monitoring needs before all else:** This is a huge step in improving the design and implementation of this long-term Arctic observing system, as resource users have the most in-depth knowledge and the highest vested interest in the species and environmental parameters that are affected by cumulative impacts and require monitoring.
2. **Training and hiring of local CBMP liaisons:** The local resident hired in each of the six communities will act as liaisons and in-community monitors for the ISR-CBMP. This will allow consistent, up-to-date Arctic observations by local experts across the ISR.
3. **Recognizing the difference between research and monitoring:** In recognizing which monitoring needs are community-driven and which are science-driven will ensure the ISR-CBMP is addressing the monitoring needs most relevant to stakeholders and resource users.
4. **Recognizing the strengths and limitations of CBMP:** Science is best for certain monitoring needs, community-based monitoring is best for others. Similarly the best use of local expert's skills should be considered. Harvesters have an important role and other community members should participate in the CBMP.
5. **Moving away from an "Externally-driven with local data collectors" CBMP design towards an "Autonomous or collaborative community monitoring"**



**CBMP design<sup>8</sup>:** By recognizing that most “community-based monitoring” in the ISR is externally-driven with trained and hired local data collectors, we see the need for more community involvement in every step of Arctic observing and monitoring to ensure stakeholders interests are the top priority for the ISR-CBMP.

- 6. Using a mixed method program design:** Incorporating both scientific (quantitative data) and traditional ecological/local expert knowledge (qualitative data) builds on the strengths of both knowledge bases, expanding the understanding of the effects of cumulative impacts on ISR wildlife and the environment. Scale is important to consider when qualitative and quantitative data and knowledge will have to be collected in a way that can be compared across both spatial and temporal scales.

### **Ensuring Arctic Observations Relevant to ISR Communities are Optimally Shared Among Communities (e.g. between scientists, governments and stakeholders)**

The CBMP will have at its core a set of community-driven variables to be tracked over time, across several areas, allowing community members and scientists to identify long-term spatial and temporal trends. The data will also be related to monitoring efforts conducted on a broader scale, so that local changes and trends can be placed into a wider context of environmental and ecological observations. Local interests will shape the parameters of the monitoring effort, so that Inuvialuit communities maintain ownership and derive direct benefit. Previously monitoring effort in the ISR were designed as stand alone projects usually led by government agencies or researchers from outside of the ISR. By having the central ISR-CBMP, we are synthesizing all community-based monitoring in the ISR, to avoid overlapping efforts and to address cumulative impacts on locally-important resources as a whole region. This is providing a space for the sharing of monitoring data local observations not only among communities, but also between government and communities and researchers and communities.

The users of the information generated by the ISR CBM are local residents, HTC's, co-management authorities, local and regional fish and wildlife managers, other Inuvialuit organizations, territorial and federal governments, the research community, educational institutions, and potentially industry and NGO interests. Users and external partners will be directly involved in the design and implementation of the program, the collection and analyses of the monitoring data and the continued evaluation of the program.

### **Specific Hindrances to the Collection and Sharing of Arctic Observations in the ISR**

Every monitoring program has hurdles which need to be overcome to collect rigorous, repeatable, and comparable data that contributes towards the recognition of trends over time. The specific hurdles to the collection and sharing of Arctic monitoring observations in the ISR are listed below:

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<sup>8</sup> 2009. Danielsen, F. et al. Local Participation in Natural Resource Monitoring: a Characterization of Approaches. *Conservation Biology*. 23 (1). pp. 31-42. <http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2008.01063.x/abstract>

1. **Reconciling community monitoring needs versus decision-maker and management monitoring needs:** Community info needs can differ from agency needs, funders or management. Ensuring open and transparent dialogue is maintained between all interested parties will be key to addressing everyone's needs.
2. **Community capacity:** Community workshops have identified the need for extensive training of hired full-time local monitors. We need to take the time and necessary investment to ensure all training requirements are completed by the hired CBMP liaisons. This training will include safety training, field data collection, data management, training on the use of various computer software packages as well as report writing.
3. **Scale:** Referring to Figure 1, the sheer size of the Inuvialuit Settlement Region does pose hindrances to data collection, the CBMP management and face-to-face communication between all communities. Travel to and from the communities for training and meetings related to the CBMP, require high levels of funding especially for the more remote communities of Sachs Harbour, Ulukhaktok and Paulatuk. Different ISR communities come from differing backgrounds, worldviews, geographical locations and monitoring interests. The sheer magnitude of the area of the ISR results in potential difficulties in spatial comparisons between monitoring indicators.
4. **Funding:** Long-term high level funding make it difficult to find reliable committed long-term local monitors as their continued wages cannot be ensured.

## Final Thoughts

With improved community capacity and local delivery, more attention can be focused on issues communities deem most critical to their needs. Design elements will include equal inclusion of TEK/LEK, how data sets are used and applied to local and regional management decisions, and ensuring that collected data is maintained in a standardized and useable format while easily accessible to all communities. The desired outcome is to have a community-driven, region-wide community-based monitoring program that synthesizes local monitoring efforts in the ISR including local, government, industry, researcher and scientist projects in relation to fish and wildlife, while supporting community needs and interests in the design and implementation of the program. Collecting and analysing the data (quantitative and qualitative) will enable decision making to occur in step with these ideals. This is a unique opportunity for a robust monitoring program designed to detect, explain, and help respond to environmental changes that may affect Inuvialuit and their communities. The desired outcome is to determine critical issues related to changes in the marine environment, and the impact of these changes on human activities in coastal region. Achieving an ISR-CBMP that is truly emplaced into the communities and develops capacity and knowledge of their environment will be worth the investment. The ISR-CBMP contributes new knowledge, local expert observations, new data input and new methodologies to the circumpolar arctic observing community.

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